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# **Pre-Installation Guide For Ultrafast Amplifiers (Ascend)**

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## When the System Arrives

Congratulations on your purchase of a Spectra-Physics system. This guide describes pre-installation information for your laser system.

Some preliminary planning is essential to avoid unnecessary delays during installation and to ensure easy operation and access to your system. You are requested to carefully consider your operating environment prior to installation. Proper water, power and room temperature are required for each system.

A checklist of pre-installation considerations is provided in this guide. You are responsible for meeting these requirements prior to installation, with due consideration given to all applicable building and safety codes.

We at Spectra-Physics intend to provide you with responsive support so that you can derive great satisfaction and value in using our systems for your applications. We are available to you at 1-800-456-2550. You could also e-mail us at [Service@Spectra-Physics.com](mailto:Service@Spectra-Physics.com)

## When the System Arrives (Continued)

### Inspection

When the system arrives, any sign of damage to the shipping crates should be brought to the attention of the delivering freight company. A claim must be filed with that commercial carrier (usually within 30 days). Notify the originating Spectra-Physics' office of any shipping damage. Shipping damage is not covered by Spectra-Physics.

Your packing list will show all items that you have ordered. Open all the packages and check each item for possible damage during shipping. Check the items against your packing list. Some items may have been installed at the factory.

Each major component of the Amplifier system comes with a manual, verify that you have received these items.

Please report any missing or damaged items to Spectra-Physics, or you may contact your Spectra-Physics' Sales Engineer.

### Review Instruction Manuals

Please read the manual to get vital information about your system. Familiarize yourself with the system. You are encouraged to spend as much time as possible reviewing the system components before your Spectra-Physics' Service Engineer arrives for the installation and training.

### Laser Safety Considerations

In addition to reviewing the sections in the manual regarding laser safety, be sure to have the proper safety glasses available for ALL lab personnel present during the installation and testing of your system. For more information, please call Spectra-Physics at 1-800-456-2552.

Ultrafast laser systems consist of multiple class 4 lasers and laser harmonic generation units. Proper understanding of the wavelengths and energy levels of any option is required. The setup and operation of any laser laboratory is subject to Federal and State regulation. Be sure to follow all applicable laws and regulations in the setup and operation of your system.

### Diagnostics

During installation, power measurements will be demonstrated on all the appropriate wavelengths. Your Service Engineer can identify which specifications will be demonstrated and the equipment necessary to conduct such tests. A non-standard system will require special consideration. To have other published specifications demonstrated, consult with your Service Engineer to determine whether additional diagnostic equipment will be required.

Daily operation of a regenerative amplifier requires a dedicated oscilloscope with a minimum of 300MHz analog bandwidth or a digital scope with a minimum of 4Gs/s sample rate with a 500MHz front end.

Other bandwidth and pulse width measuring equipment should be available. A power meter, and spectrometer are basic tools needed for any analysis of system performance.

## Pre-installation Considerations

### Location and Environment

The location of the system and environment of your lab should have the following features:

- a. A safe location that meets all applicable building codes.
- b. Easy access with adequate clearance around the instrument.
- c. Proper air conditioning could be critical for the performance of the laser. For certain applications ambient room temperature changes may be an important factor for the laser system's performance. Air ducts should not blow directly on laser or optical path. To ensure stable day-to-day operation, the recommended minimum and maximum room temperatures are 15 and 25°C. Room temperature should ideally be 20°C and should not fluctuate more than  $\pm 1^\circ\text{C}$  during an eight- hour period.
- d. In some applications vibration isolation may be required for your system. Structural integrity of the flooring could play an important role.
- e. Please note that the laser head required a sturdy breadboard or optical table.
- f. Consider room requirements for future maintenance and upgrades by your Spectra- Physics' Field Service Engineer.

### Physical Description

| <b>Amplifier</b>                        | <b>Height</b> | <b>Width</b>                   | <b>Length</b> | <b>Weight (lbs)</b> |
|---|---------------|--------------------------------|---------------|---------------------|
| Solstice ACE                            | 10.5"         | 27"                            | 49"           | 480                 |
| Solstice ACE Umbilical length           |               |                                | 12'           |                     |
| Spitfire ACE                            | 9.36"         | 24.0"                          | 60"           | 400                 |
| Spitfire ACE Umbilical Length           |               | (x2)                           | 9.5'          |                     |
| Spitfire ACE PA                         | 9.36"         | 30.0"                          | 60"           | 400                 |
| Spitfire ACE PA Umbilical Lengths       |               | (x3)                           | 9.5"          |                     |
| <b>Ascend*</b>                          | <b>Height</b> | <b>Width</b>                   | <b>Length</b> | <b>Weight (lbs)</b> |
| Laser Head                              | 7.1"          | 10.0"                          | 20"           | 47                  |
| Power Supply                            | 7"            | 18"                            | 19"           | 35                  |
| Umbilical Length                        |               |                                | 109"          |                     |
| High Capacity Chiller                   | 22.7"         | 14.5"                          | 27.7"         | 122                 |
| Standard Ascend hose lengths are ~ 2 M. |               | 5 and 10 M hoses are available |               |                     |
| <b>Mai Tai *</b>                        | <b>Height</b> | <b>Width</b>                   | <b>Length</b> | <b>Weight (lbs)</b> |
| Laser Head                              | 5.8"          | 13.8"                          | 23.4"         | 70                  |
| Mai Tai Power Supply                    | 6.9"          | 17.9"                          | 19.0"         | 55                  |
| Umbilical Length                        |               | 10'                            |               |                     |
| Chiller                                 | 22.7"         | 14.5"                          | 27.7"         | 122                 |
| <b>OPA</b>                              | <b>Height</b> | <b>Width</b>                   | <b>Length</b> |                     |
| Topas                                   | 6.6"          | 8.7"                           | 22.8"         |                     |

\*Part of Solstice ACE, external to Spitfire ACE.

A Spectra Physics regenerative amplifier has 2 control boxes (3 for an ACE PA) and a control computer associated with it. Each Ascend has a control computer and High Capacity Chiller. The TDG (timing), and the TCU(s) (temperature) are standard rack mount 17.9" x 19" x 3.5" boxes. Spectra Physics Amplifier Systems come with laptops preloaded and tested with the proper GUIs and all required cables. Spectra Physics will try to support but does not guarantee any other control scheme.

## Pre-installation Considerations (Continued)

### Amplifier Utility Services

Each Spectra-Physics' laser system has its own water, electrical, nitrogen and room air requirements. To ensure smooth uninterrupted operation, each system should have dedicated utility services. All chiller cooled lasers specified here not using the special Nalco cooling solution require steam-distilled water to be provided on site at installation (~3 gallons). Nalco is required for Ascend Chillers (provided at install). In the United States, the Ascend and Mai Tai Chillers require a NEMA 5-20R T slot receptacle. All other power supplies, chillers and control units require standard NEMA 5-15R receptacles. We recommend using a separate circuit for each power supply and chiller and on circuit for the control units. NEMA 5-20R T receptacles work with both types of plugs that come with the system.

**Please be aware that a Spectra-Physics' service engineers cannot perform electrical or plumbing work at your site.**

### Electrical Services

Before connecting the power supply to the AC power line, make sure that all power supply power switches are OFF.

| Model               | Nominal Voltage; Freq. | Maximum Current 2A | Needs Separate Outlet? |
|---------------------|------------------------|--------------------|------------------------|
| TDG                 | 110/230VAC;60/50Hz     | 2A                 | No                     |
| TCU                 | 110/230VAC;60/50Hz     | 2A                 | No                     |
| TOPAS OPA           | 110/220VAC;60/50Hz     | 2A                 | No                     |
| MaiTai Power Supply | 110/230VAC;60/50Hz     | 15A/10A            | Yes, 15A needed        |
| MaiTai Chiller      | 110/220VAC;60/50Hz     | 20A/15A            | Yes, 20A needed        |
| Ascend Power Supply | 10/240VAC;60/50Hz      | 15A/10A            | Yes, 15A needed        |
| Ascend Chiller      | 110/220VAC;60/50Hz     | 20A/15A            | Yes, 20A needed        |

### General Specifications

Up to date specifications for any Spectra Physics laser system are always available from the Newport web site: [WWW.Newport.com. http://www.newport.com/Ultrafast-Lasers/989320/1033/content.aspx](http://www.newport.com/Ultrafast-Lasers/989320/1033/content.aspx)

You can also contact your Newport Spectra Physics Sales Engineer or Spectra Physics Service Support to answer any questions regarding your system at 1-800-456-2552.

## Required Maintenance

TCU-Please refer to user's manual for instructions to change desiccant in TCU when humidity is >10%. 0135-1923S TCU Purge Filter.

Ascend-Periodically check particle filter on power supply air intake. Use a vacuum to clean up any debris or particles on the filter.

High capacity chiller-Chiller filter and coolant should be changed every 6 months. Only distilled water or Nalco solution (PN:1607-0456). NO DI water. Please contact a Spectra-Physics representative with the model of your chiller for correct chiller filter.

MaiTai-Please refer to user's manual for instructions to change purge filters when humidity is >10%.

90074765-Purge Replacement Unit.

## Pre-Installation Checklist

Before the arrival of your Spectra-Physics Service Engineer please review the following pre-installation requirements. When all the requirements have been met, initial the boxes and fax a signed copy to the Spectra- Physics Service department at **(408) 980-6921**.

### Physical Location:

- A location with adequate clearance around system to conduct service and accessible by Spectra-Physics' personnel.
- A temperature-controlled room.
- Utility services have been installed.
- Local building and safety codes are in compliance and have been verified.

### When Your System Arrives:

- Check crates for damage.  
(If damaged, file a claim with the carrier and notify Spectra-Physics.)
- Uncrate and place the system on your work surface.  
(Two or more people may be required to lift some equipment.)
- Compare the packing list with your quotation. Call your Spectra- Physics office about any discrepancies.
- Check that all manuals were received.
- Save all packing and shipping material until the installation has been completed.
- Obtain the correct safety glasses and a power meter.

\_\_\_\_\_  
Customer Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Phone Number

\_\_\_\_\_  
Fax Number

\_\_\_\_\_  
E-Mail

\_\_\_\_\_  
Sales Order Number